Geriatric assessment among elderly patients undergoing urological surgery: A systematic literature review

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Abstract

The elderly constitute the group of patients who most often undergo elective urological procedures, and they are at the highest risk of poor surgical outcomes because of comorbidity and frailty. The current model of qualification for surgery is often subjective and based on tools which do not address the characteristics of the elderly. The Comprehensive Geriatric Assessment (CGA) and screening tools can help in the evaluation of older, particularly frail patients. The aim of the study was to review the literature on the usefulness of preoperative geriatric evaluation in patients undergoing urological treatment. The review was based on MEDLINE/PubMed, Embase and Cochrane Library bibliographic databases from 2000–2017 for full-text, English-language publications meeting pre-defined criteria. Six prospective and 3 retrospective studies were selected for further analysis. The patient populations, methods of geriatric assessment, interventions, and outcome measures varied between the studies. None of the studies were randomized controlled trials. In 2 studies, the CGA was used; in other studies, rather basic screening tests were used. In only 2 studies, an intervention was performed after the CGA. In general, the variables of the CGA were both prospectively and retrospectively significant predictors of complications of urological surgery. Although the use of CGA is not a standard practice in everyday urological clinical practice, components of the CGA appear to be predictive of postoperative complications. Therefore, inclusion of geriatric assessment as part of routine preoperative care in geriatric urology patients should be considered. Because of the lack of randomized controlled trials on preoperative CGAs in urology patients, further studies are needed.

Key words: elderly, preoperative assessment, frailty, geriatric assessment, urological surgery

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Introduction

Older patients constitute a growing, very heterogeneous group with a variety of comorbidities and biological reserves.[1] Some of them present with frailty syndrome, which is by definition a state of increased vulnerability and a loss of resistance to external stressors, resulting in an increased risk of adverse outcomes. Frailty syndrome predisposes a patient to poor surgical outcomes,[2–6] including urological procedures.[7,8] A routine preoperative assessment of urology patients (based on medical history, physical examination, laboratory tests, as well as the American Society of Anesthesiologists (ASA), and the Eastern Cooperative Oncology Group (ECOG) scales) does not provide enough data to treat older patients with full regard for their specific health needs.[9,10] Aronson et al.[11] showed high inter-observer variability between staff members assigning ASA scores and a tendency to overestimate preoperative risk. Comorbidity – even when described using the Charlson Comorbidity Index (CCI) or the Cumulative Illness Rating Scale (CIRS), or with risk calculators – is still only based on previously diagnosed conditions and does not include an evaluation of subclinical physiological, nutritional or cognitive deficits.[12–14] Thus, there is a gap between the growing need for adequate, optimal preoperative assessment of older patients and the utility of commonly used preoperative assessment tools which were not developed specifically for elderly patients. Frailty seems to be a strong and important risk factor of poor surgical outcomes. The Comprehensive Geriatric Assessment (CGA) seems to be an efficient assessment tool that can identify frail older patients.[1]

Objectives

The aim of the study was to review the literature on the usefulness of preoperative geriatric evaluation in older patients undergoing urological treatment.

Material and methods

We searched the MEDLINE/PubMed Embase and Cochrane Library databases for publications from 2000 to 2017 (week 48). Two independent researchers (CM and KJ) screened all resulting abstracts according to the inclusion and exclusion criteria and any discrepancies were resolved through a third reviewer (PM). The databases were searched for the terms "geriatric assessment", "frailty" and "urology". Relevant papers were also identified through a manual search of the reference list of potentially relevant articles, and papers on screening for frailty were also considered.

Studies included in this review met the following criteria: full-text papers published in English between January 1, 2000 and November 30, 2017, prospective or retrospective study designs, and populations which included geriatric patients undergoing elective surgical procedures, preoperative assessments using the CGA domains or frailty screening tests as predictors of the patients' main surgical outcomes, which were: complications, 30-day mortality, discharge to an institution or other (length of stay, delay of operation or readmission). Studies in which only one specific outcome was measured (but not complications within 30 days) were excluded.

Results

The electronic and manual searches identified 191 potentially relevant publications for further evaluation. After duplicate removal and initial screening, 11 full-text articles were screened. Finally, 9 full-text English language articles met the inclusion criteria: 6 studies were prospective[7,15–18,19] and 3 were retrospective.[20–22] Figure 1 presents the flowchart of the search strategy based on PRISMA guidelines.

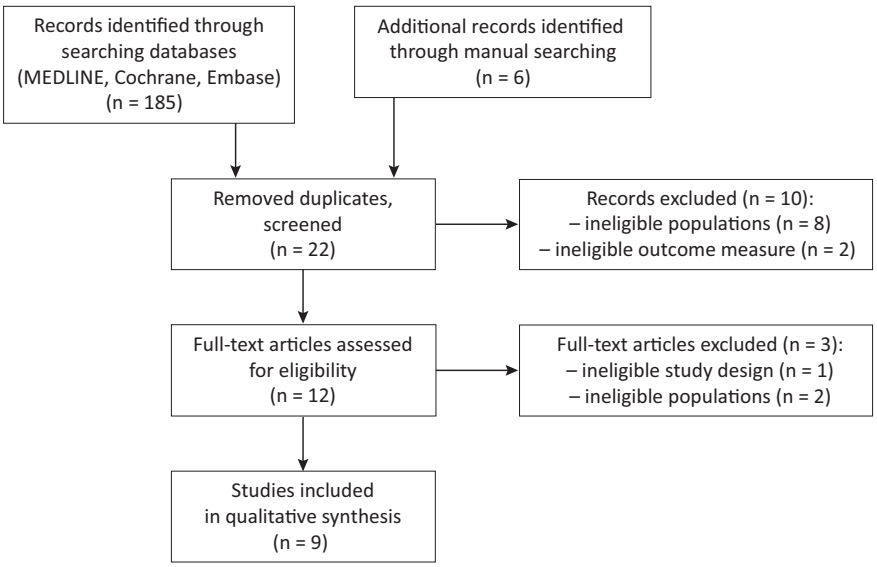

Fig. 1. The PRISMA flowchart

Prospective studies

None of the prospective studies were randomized trials. All studies were heterogeneous in population, study design and outcome measures, so meta-analysis was precluded.

In their prospective observational study, Dal Moro et al.[19] recruited 78 urology patients (86% men and 14% women) aged ≥70 years who had qualified for endoscopic transurethral resection of prostate (TURP), transurethral resection of bladder tumor (TURBT) with a tumor size of >4 cm or "open" procedures (radical cystectomy, radical prostatectomy or radical nephrectomy) in order to verify the predictive value of frailty for postoperative complications. Patients were evaluated for frailty with the Edmonton Frail Scale (EFS), which screens for cognitive impairment, dependence in instrumental activities of daily living (iADL), recent burden of illness, self-perceived health, depression, weight loss, medication issues, incontinence, inadequate social support, and mobility problems. Standard medical and urological histories were taken. Patients were evaluated with use of the Pre-operative Assessment of Cancer in the Elderly (PACE) components: the ASA classification, the Mini-Mental State Examination, activities of daily living (ADL), iADL, the Geriatric Depression Scale, the ECOG scale, and the Satarian Index of Comorbidities.

Postoperative outcomes were complications, both medical and surgical, mortality and rehospitalization within 3 months. The overall prevalence of frailty was 21.8% and male patients were frailer than female patients ($p = 0.003$). In both the open and endoscopic surgery groups, patients with complications were significantly frailer than those without complications in univariate analysis, but in multivariate analysis there was no significant correlation between frailty indices and the risk of major complications. The authors assumed this was probably due to the small number of cases and the low rate of complications. Despite these ambiguous findings, the authors stated that the EFS is a simple, quick and easy-to-administer test which assesses patients' physical and psychosocial characteristics. In consequence, the authors see a need for further well-designed studies focusing on urology to develop risk-reduction strategies for frail elderly patients.

Ellis et al.[15] conducted an evaluation of a nurse-led preoperative assessment service for elderly patients who had qualified for orthopedic, urological and general surgical procedures. The assessment consisted of basic investigation and diagnostic tools, such as the Mini-Mental State Examination for cognitive problems and the Barthel Index for the assessment of ADL. In the first 5 months, 141 eligible patients qualified for the control group (over 65 years of age with one or more of the following found in the preoperative assessment: cognitive or mobility problems or concerns about daily activities, falls or home circumstances). The need for additional intervention was noted, but no intervention was undertaken. In the next 6 months, 172 patients were evaluated and, if necessary, referred for appropriate intervention (physiotherapy, occupational therapy, dietician, social work, falls teams, family doctor's care, or other). In both groups, the mean age was similar (73.3 vs 72.7 years). Urological procedures (TURBT, TURP and "other renal" procedures) were performed in 32.6% of the control group and in 35.5% of the intervention group. Unfortunately, outcomes for urology groups as separate cohorts are unavailable. During the intervention phase, fewer operations were cancelled (5.2% vs 17.7%; $p < 0.001$), the mean length of stay was shorter (4.9 days vs 8.9 days; $p < 0.01$) and the rate of postoperative complications was lower (2.3% vs 8.5%; $p = 0.01$).

Revening et al.[16] recruited 80 patients over 18 years of age who had qualified for minimally invasive surgery. Most were urological procedures: 49 renal/urethral surgeries, 12 robot-assisted prostatectomies, 2 robot-assisted radical cystectomies, and 17 general-surgery operations. Standard preoperative assessments were performed. Additionally, patients were evaluated for frailty using the Fried criteria (shrinking, weakness, exhaustion, low activity, and slower walking speed). The primary outcome was the incidence of postoperative complications within 30 days of surgery, as assessed using the Clavien–Dindo scale. The secondary outcomes were mortality, length of stay and discharge to a skilled nursing facility. Only 2 patients were frail and 11 were intermediately frail; therefore, both groups were analyzed as a single group and compared with the non-frail group. Outcomes for the urology group as a separate cohort are unavailable. The mean age was 60 years (range: 19–87). The mean CCI was 3.99 ±1.85. Many of the patients (62.5%) had an ASA score ≥3 and 86.25% of the patients had an ECOG performance status of 0. The intermediately frail or frail patients comprised 16.25% of the study population. The 30-day postoperative rate of complications was 16.25%. Of these complications, according to the Clavien–Dindo classification, 15.4% were IIIa, 7.7% were IIIb and 7.7% were IV. Patients in the intermediately frail or frail group were 6 times more likely to experience postoperative complications (OR = 5.91; 95% CI = 1.25–27.96; $p = 0.025$). The authors were aware of the limitations of the research, but suggested the potential utility of preoperative frailty assessment in patients undergoing minimally invasive procedures.

Revening et al.[17] enrolled 189 patients over the age of 18 years in further research on preoperative assessment: 117 from urology clinics, 52 from surgical oncology clinics and 20 from general surgery clinics. In addition to standard preoperative evaluation, frailty was assessed with the Fried criteria. The primary outcome was postoperative complications within 30 days of surgery of any grade on the Clavien–Dindo classification. The mean age was 62 years. Patients who were intermediately frail or frail were more likely to experience postoperative complications (OR = 2.07, 95% CI = 1.05–4.08; $p = 0.036$). Of all other preoperative assessment tools, only hemoglobin levels had a significant correlation, and higher levels were

protective of complications within 30 days (p = 0.033). As with the other studies, outcomes for the urology group as a separate cohort were unavailable.

In another study by Revening et al.,[7] the researchers enrolled 351 patients who had qualified for major general and oncological urological surgeries – excluding endoscopic procedures such as TURBT. As before, a standard preoperative assessment was performed and the patients were evaluated for frailty using the Fried criteria. The primary outcomes were postoperative complications within 30 days of surgery – as assessed using the Clavien–Dindo scale – mortality and discharge to a skilled nursing facility. A predictive model for 30-day complications using frailty and other preoperative variables, such as the ASA score, the CCI, age, and serum hemoglobin and serum albumin levels, was constructed. In the end, 351 patients were analyzed. The mean age of the patients was 63 years (range: 19–87). The median age-adjusted CCI (ACCI) was 4. The ASA score was 1 or 2 in 24.8% of the patients and 3 or higher in 75.2%. An ECOG performance status of 0 or 1 was found in 96% of them and of 2 or higher in 4%. Urological procedures (e.g., radical or partial nephrectomy, radical cystectomy with urinary diversion, open or robotic-assisted radical prostatectomy, etc.) were performed in 205 patients (58.4%), and 146 patients (41.6%) had major general surgery. According to the Fried criteria, 255 patients (72.6%) were fit, 86 (24.5%) were intermediately frail and 10 (2.8%) were frail. Thirty-day major postoperative complications (of Clavien–Dindo grade III or higher) occurred in 50 patients (14.2%), and the 30-day mortality rate was 1.7%. Eight patients (2.3%) were discharged to a nursing care facility. Statistical analysis revealed a significant correlation between the Fried Frailty Criteria and the occurrence of 30-day complications (p = 0.002). Furthermore, shrinking and grip strength taken together performed as well as the full 5-component frailty criteria. The addition of ASA score and serum hemoglobin levels to the model of shrinking and grip strength resulted in the most sensitive and specific measure of 30-day complications (AUC = 0.632; p < 0.001, according to the authors).

Braude et al.[18] prospectively assessed the impact of introducing a geriatric service for urology patients, the Proactive Care of Older People Undergoing Surgery (POPS). They conducted the study in 2 phases. The aim of the 1st phase was to reduce postoperative length of stay, while the aim of the 2nd phase was to optimize the process: to improve the identification of geriatric syndromes, to facilitate proper intervention according to the CGA and to extend the application of the geriatric service to younger patients. In phase 1, patients aged ≥65 years who had qualified for elective or emergency urological surgery were enrolled into 2 groups: 112 patients into the control group (enrolled 1 year before the start of the intervention phase) and 130 patients into the intervention group. The intervention included a daily interdisciplinary round led by a POPS consultant or geriatric nurse, a weekly multidisciplinary team (MDT) meeting and a twice-weekly ward round, where patients whose cases were highlighted at the interdisciplinary round were discussed. The outcomes included cancellation of surgery, length of stay, postoperative complications, unplanned readmissions, and death within 30 days of discharge. After the intervention, the length of stay was shorter (4.0 vs 4.9 days) and the rate of postoperative complications was 4 times lower. The cancellation rate decreased from 10% to 5% and the readmission rate decreased from 8% to 3%, although the changes were not statistically significant (p = 0.12). Within the control group, 3 deaths occurred. In the 2nd phase (the quality improvement phase), several modifications were instituted: patients were included if they were ≥65 years old or were suspected for frailty, irrespective of age, the interdisciplinary round was replaced with a read-do Geriatric Surgery Checklist (GSCL) and 1 junior doctor from each of the 4 urology teams, an occupational therapist, a physiotherapist and a POPS social worker joined the group. The results of the follow-up survey completed by the staff confirmed that the POPS program had been successfully incorporated in the inpatient urology ward.

Retrospective studies

Lascano et al.[20] retrospectively compared a modified frailty index predicting poor surgical outcomes with other risk stratification tools among patients undergoing urological surgery due to malignancy. They searched the American College of Surgeons National Surgical Quality Improvement Program database (NSQIP) from 2005 to 2013 to identify patients undergoing major urological procedures. They modified the 11-variable Canadian Study of Health and Aging Frailty Index by adding 4 more variables relevant to oncology patients: weight loss, chemotherapy or radiation before surgery, history of metastasis and severe renal failure. The main outcome measures were mortality and Clavien–Dindo grade IV complications. A total of 41,681 patients were identified and included in the study. The elderly patients were concentrated in the groups of nephroureterectomy and radical cystectomy. The patients with a high frailty index score were at an almost fourfold higher risk of a Clavien–Dindo grade IV event (CI = 2.865–4.788; p < 0.0005) and an almost sixfold greater risk of 30-day mortality (CI = 3.72–9.51; p < 0.0005) than the non-frail patients, after adjusting for race, sex, age, smoking history, and type of surgery. Mortality after surgery was highest in the patients undergoing radical cystectomy (2.6%) and lowest in those undergoing radical prostatectomy (0.2%). The radical prostatectomy patients were a lower-risk group overall. The modified frailty index was comparable or superior to the CCI but inferior to the ASA classification in predicting postoperative complications. Compared to the ASA, the modified frailty index was superior to other tools in all aspects.

Suskind et al.[21] also used data from the NSQIP from 2007 to 2013, and they identified 95,108 patients aged ≥40 years who underwent common urological procedures appearing in the registry more than 1,000 times. Frailty was measured using the NSQIP frailty index. The main outcome was the rate of complications within 30 days of surgery. The majority of patients (67.8%) undergoing surgery were aged ≥61 years. The average frequency of complications was 11.7%, with the most common complications being readmission (6.2%), blood transfusion (4.6%) and urinary tract infection (3.1%). The rate of complications increased with increased frailty index (adjusted OR = 1.74; 95% CI = 1.64–1.85) regardless of the patient's age.

Moreover, Isharwal et al.[22] searched the NSQIP database from 2005 to 2011 to identify patients who had undergone urological procedures. They divided the patients into 2 groups: complex (inpatient) and simple (outpatient) procedures. Preoperative frailty was assessed using the Risk Analysis Index (RAI), a tool which uses preoperative history and physical examination without a detailed geriatric evaluation. The variables of the RAI were age, gender, admission to a nursing home in the last 3 months, weight loss, poor appetite, renal failure, chronic heart failure, shortness of breath, cancer, cognitive problems, and ADL. The primary outcomes were mortality and complications, whereas the secondary outcomes were length of stay, re-operation, 30-day readmission and discharge not to home (data only for 2011). A total of 42,715 patients were included: 25,693 in the complex procedure group and 17,022 in the simple procedure group. Complications, mortality rate and other measures of poor surgical outcomes increased with an increased RAI score. Interestingly, mortality in patients with a high RAI score were similar in the 2 groups, whereas the rate of complications was greater in the complex procedure group. The main characteristics of all studies included in this review are summarized in Tables 1 and 2.

Table 1. Characteristic of included studies

Study	Study time	Number of patients, gender	Inclusion criteria	Surgical procedures	Complications
Dal Moro et al.[19]	ND	78 (14% female)	Age ≥70, major urological procedure (endoscopic or open)	Radical cystectomy, prostatectomy, nephrectomy, TURP, TURBT (>4 cm of tumor size)	According to Clavien–Dindo scale within 3 months
Ellis et al.[15]	2009–2010	141 (62% female) in control group and 172 (55% female) in intervention group	Age ≥65, elective surgery	In urological group: TURBT, TURP, "other renal", general, surgery, orthopedic procedures	Wound problems, infections, alcohol withdrawal, other not specified
Revening et al.[16]	ND	80 (42.5% female)	Age ≥18, elective surgery	61.25% renal/ureteral surgeries, 15% robot-assisted prostatectomies, 8.75% hepatobiliary and pancreas surgeries, 6.25% gastric surgeries, 2.5% robot-assisted cystectomies	According to Clavien–Dindo scale within 30 days, mortality, discharge to a skilled nursing facility
Revening et al.[17]	ND	189 (40.2% female)	Age ≥18, elective surgery	Elective urological (62%) or general surgery, endoscopic procedures excluded	According to Clavien–Dindo scale within 30 days, mortality, discharge to a skilled nursing facility
Revening et al.[7]	ND	351 (39 % female)	Age ≥18, elective surgery	Elective urological (58.4%) or general surgery, endoscopic procedures excluded	According to Clavien–Dindo scale within 30 days, mortality, discharge to a skilled nursing facility
Braude et al.[18]	2007–2014	112 (13% female) in control group, 130 (18% female) in intervention group	Age ≥65, elective or emergency urological surgery	Elective or emergency urological surgery	Length of stay, surgery cancellation rate, unplanned readmission within 30 days, surgical/medical complications, death
Lascano et al.[20]	2005–2013	41,681 (16% females)	Elective urological surgery for malignancy	Elective major urological oncology procedures (cystectomy, prostatectomy, nephrectomy, nephroureterectomy)	Mortality, Clavien–Dindo grade IV
Suskind et al.[21]	2007–2013	95,108, no data for gender	Age ≥40, urological procedure that appears more than 1,000 times in the NSQIP database from 2007 to 2013	21 most common urological procedures	30-day complication rate
Isharwal et al.[22]	2005–2011	42,715, no data for gender	Patients undergoing urological in- or outpatient procedure	Common urological procedures both in- and outpatients	Mortality, Clavien–Dindo grade III, IV and V complications, length of stay, re-operation, readmission within 30 days

ND – no data; TURP – transurethral resection of the prostate; TURBT – transurethral resection of the bladder tumor.

Table 2. Characteristic of included studies

Study	Assessment tool	Usefulness of geriatric assessment	Comment
Dal Moro et al.[19]	CCI, ACCI, EFS, PACE	EFS – simple, easy and quick-to-administer PACE – complex and lengthy to administer	Prospective study, usefulness of PACE not clear. No significant relationship between frailty and complications
Ellis et al.[15]	MMSE, ADL, basic investigation	Preoperative assessment led by an intervention (if needed): significantly fewer cancellations, shorter stay, lower complications rate	Prospective study, nurse-led preoperative assessment, 2 groups: control group and intervention group, no data for urological patients separately
Revening et al.[16]	Frailty evaluation using Fried criteria, ASA, ECOG, CCI, standard preoperative assessment	Presence of frailty significantly increases risk of complications	Prospective study, mean age 60 years (range: 19–87 years) – age was not a predictor of complications. Low frailty rate – study population divided into 3 groups: not frail (83.75%), intermediately frail (13.75%) and frail (2.5%); no data for urological patients separately, but most procedures were urological
Revening et al.[17]	Frailty evaluation using Fried criteria, ASA, ECOG, CCI, CES-D (Center for Epidemiologic Studies Depression Scale), MNA (Mini Nutritional Assessment), ADL, standard preoperative assessment	Assessment of frailty is feasible in multidisciplinary patient population. Frailty is a predictor of postoperative complications	Prospective study, mean age 62 years (range: 19–82 years), no data for urological patients separately, but most were urological patients. Age was not a predictor of complications. Higher level of hemoglobin was protective for complications
Revening et al.[7]	Frailty evaluation using Fried criteria, ASA, ECOG, CCI, CES-D, MNA, ADL, standard preoperative assessment	Frailty is a predictor of postoperative complications. Shrinking and grip strength together performed equivalently to the full 5-component frailty criteria. Addition of ASA and serum hemoglobin level to the model of shrinking and grip strength demonstrated the most sensitive and specific predictor of complications	Prospective study, mean age 63 years (range: 19–87 years), no data for urological patients separately, but most were urological patients. Age was a predictor of complications
Braude et al.[18]	POPS CCI	After intervention followed the geriatric assessment: lower cancellation rate, shorter stay, lower complications rate, lower readmission rate	Prospective study. Two phases – the 2nd phase was the improvement phase
Lascano et al.[20]	MFI, CCI, ASA	High frailty index: 4-times higher risk of Clavien–Dindo IV grade complication and 6-times higher risk of 30-day mortality. MFI superior to CCI, but inferior to ASA. MFI associated with ASA was the best complications prediction tool	Retrospective study based on NSQIP database search. Mean age 61 years. Lack of detailed geriatric assessment
Suskind et al.[21]	NSQIP Frailty Index	Complications rate increased with the increase of frailty index regardless of patient's age	Retrospective study based on NSQIP database search. Lack of detailed geriatric assessment. Readmission and blood transfusion treated as complications; 67.8% procedures performed in patients ≥61
Isharwal et al.[22]	RAI using preoperative history, comorbidities, ADL	Complications rate increased with increasing RAI score, but prospective validation of RAI is needed	Retrospective study, no data for age. Lack of detailed geriatric assessment

CCI – Charlson Comorbidity Index; ACCI – Age-adjusted Charlson Comorbidity Index; EFS – Edmonton Frail Scale; PACE – Pre-operative Assessment of Cancer in the Elderly; MMSE – Mini-Mental State Examination; ADL – Activities of Daily Living; ASA – American Society of Anesthesiology; ECOG – Eastern Cooperative Oncology Group scale; CES-D – Center for Epidemiologic Studies Depression Scale; MNA – Mini Nutritional Assessment; POPS – Proactive care of Older People undergoing surgery; MFI – Modified Frailty Index; NSQIP – The American College of Surgeons National Surgical Quality Improvement Program; RAI – Risk Analysis Index.

Discussion

The World Health Organization (WHO) recognizes 60 years of age as the beginning of old age. However, the age of 65 years is very often encountered in the literature. The population of people aged 65 years or older is constantly growing. It currently represents about 14% of the Polish population, and in 2035 it will increase to 30–35%.[23] Half of all cancer cases and 2/3 of cancer deaths are among elderly patients.[24] Older people form the largest group requiring surgical treatment – almost 2/3 of urological surgeries are performed in elderly patients.[25] Therefore, urologists will be increasingly confronted with the difficulties of treating the elderly, especially due to the differences between them and younger patients.[26]

Currently, there is no widely accepted system developed specifically for the elderly that helps qualify them for specific oncological treatment. It is important to understand that one's biological age is often different from one's actual age. Unfortunately, the estimation of biological age by doctors is not entirely accurate. Several tools allowing the estimation of remaining life expectancy are available. Tables on life expectancy are available in most countries, but using observation or intuition is the most common method of estimating remaining life expectancy.[27] Older patients, including urology patients, are less likely than

younger patients to receive radical oncological treatment.[28] This may be due to the overestimation of their biological age as the sole risk factor for poor surgical outcomes.

In the treatment of muscle-invasive bladder cancer, radical cystectomy is the standard treatment, but among the patients between 70 and 80 years of age, only 40–50% undergo cystectomy; likewise, only 13–30% of 80-year-olds have such treatment.[29] In the management of organ-confined prostate cancer, the guidelines of urological societies suggest radical treatment in men whose estimated remaining life expectancy exceeds 10 years, though urologists and oncologists are typically not very accurate in estimating patients' remaining life expectancy. In 2005, Wilson et al.[30] showed that the estimation of patients' life expectancy by urologists and oncologists is very subjective; the same patient was often evaluated differently by the same physician, the accuracy of the assessment was based on the physician's own experience and the chances of 10-year survival were usually underestimated. All of this could lead to inadequate treatment: up to 34% of patients would not receive optimal treatment on the basis of an overly pessimistic estimation.

Schwartz et al.[31] also demonstrated the impact of age on decision-making in 2003. Suboptimal prostate cancer treatment was received by 14% of all subjects, but in the group of patients aged 70 years or older, the proportion was significantly greater: over 47% of those with a Gleason score of 5–7 and 73% of those with a Gleason score of 8–10. The risk factors for suboptimal treatment were age, comorbidities and Gleason score. The literature on elderly oncology patients with comorbidities currently suggests that chronological age should no longer be the basis for therapeutic decision-making, but that a broader geriatric assessment should be relied upon,[32] because a healthy and fit elderly person may be a better candidate for surgical treatment than a younger but burdened patient. This postulate was confirmed by the SIOG in 2010. They recommended classifying patients into 4 groups; "healthy," "vulnerable," "frail" and "terminal." Patients in the "healthy" and "vulnerable" groups should be offered the standard treatment, regardless of their age.[33]

Up to 75% of patients over the age of 85 are not frail, although frailty does tend to increase with age.[19] Frailty is a concept introduced by geriatricians that identifies elderly patients at an increased risk for falls, hospitalization and death. At present, this concept is more and more often adapted as a risk-stratification tool in surgically treated individuals. In numerous studies, screening for frailty was superior to traditional methods of evaluation; thus, frailty has become a broadly accepted risk factor of poor surgical outcomes in many surgical settings.[7,34] Frailty can be assessed using many screening tests, but the gold standard is a detailed geriatric assessment (GA). Moreover, it is worth noting that GA is not necessary in all patients, that it requires experience and it is time-consuming.[1] Therefore, a variety of screening tests may be useful (VES-13, GFI, G8, TRST, aCGA, Rockwood, Balducci, or Fried) in identifying patients requiring broader geriatric assessment.[35–42] The CGA as part of a preoperative assessment has been well-described in general surgery, thoracic surgery and orthopedics,[1,43–49] but not in urology. In most studies, screening for frailty and geriatric assessment were simple risk stratification tools for predicting poor surgical outcomes. In only a few studies was geriatric assessment followed by an intervention for which the concept of frailty and the CGA were constructed. Partridge et al.[50] performed a systematic literature review on the impact of geriatric assessment on postoperative outcomes in the elderly, including only prospective studies with preoperative evaluation, intervention and measurement of postoperative outcomes in phases, and excluding studies with frailty assessment and geriatric assessment as risk tools. Only 5 studies met the inclusion criteria, and 2 of those were randomized controlled trials. The results were encouraging and suggested that geriatric assessment is not only a risk-stratification tool, but is also beneficial in reducing poor postoperative outcomes in elderly patients if followed with a proper intervention.

Despite these findings, in only a few studies was the impact of frailty and GA on postoperative outcomes of urological surgery described. We searched MEDLINE/PubMed, Embase and Cochrane Library databases for publications from 2000–2017 (week 48), using the inclusion and exclusion criteria and the terms "geriatric assessment", "frailty" and "urology". The use of other terms did not yield more results. Nine studies were included in our review. None of these studies were randomized controlled trials. There were differences in the patient populations: in 2 studies with an intervention phase, only elderly patients were enrolled, while in others younger patients were also included.[15,18] We included these studies because the mean age of the participants and the type of surgery strongly suggested that most of the patients were elderly.

In all of the retrospective studies and in one of the prospective studies, only urology patients were evaluated; in the others, patients undergoing other types of surgery were included, and there was no data for urology patients as a separate cohort. The methods of geriatric assessment also differed. Braude et al.[18] and Ellis et al.[15] performed preoperative comprehensive geriatric assessment, while in the other studies only screening tests for frailty were used. The common outcome measures were complications within 30 days, mortality and – in several studies – length of stay, unplanned readmission or cancellation of operation. The high level of heterogeneity makes it impossible to compare these studies or to draw any meaningful conclusions. However, in all of the studies included in our review, either frailty screening or GA was confirmed as an important risk-stratification tool, and in 2 studies designed as prospective trials with an intervention phase, the effect of basing intervention on CGA encouraged further studies.

Practical aspects

In modern urology units, patients undergoing major surgery are admitted the day before surgery in most cases. This timeframe does not allow for a detailed geriatric assessment followed by any intervention. If it is known much earlier that a major oncological urological procedure is necessary, the optimal time for geriatric evaluation appears to be about 4 weeks before admission, which would allow for intervention or delayed surgery with a clear understanding of the planned procedure and associated risks.[51]

Conclusions

The current knowledge on preoperative geriatric assessment in elderly urology patients is sparse. Preoperative identification of frailty in such patients seems to be an important tool in daily urological practice. Moreover, proper stratification of preoperative frailty may lead to a decrease in postoperative complications. The traditional tools for preoperative evaluation seem to be inferior to frailty screening in predicting surgical risk. However, the latest literature does not provide strong data on the preoperative use of the CGA or its impact on surgical outcomes in elderly urology patients. Thus, further research in urological settings is needed, especially in multicenter randomized controlled trials.

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